

ing to the density of population. Sickness under the Government Subsidy for illness is not to be associated with relief of the economic status of the patient. It is essential to keep these separate.

There should be lay control of sick benefits, planned from previous experience gained by the methods of lodges and industrial accident reports on the subject. We, as physicians, then devote all our interests to the physical relief, not on the patient's ability to recover money for his illness.

Physical Examination Twice Yearly:

Physical examinations required twice yearly of all the less than \$2,000 income group, thus preventing extensive inroads of disease before being recognized by the patient, causing an additional economic burden necessitating more serious operative procedures or longer medical care for return to normal.

The United States Public Health Service to be used by the Government for the establishment of local health officers devoting their entire time to preventive medicine or prevention of disease by immunization and control of plagues, epidemics or other possible sources of infection.

COMMENT

Such a plan as the above must have just reason to be born and also be practical enough to exist.

Let us review the good points. If the good is better than the evil of such a plan its principle should be adopted.

1. The members of this group, the less than \$2,000 income group, are not in any sense of the word charity patients, yet many, due to extenuating circumstances, are forced to use county hospital service. Under the above plan they will receive adequate care without the stigma of being a county hospital patient.

2. They will have free choice of physicians which they often do not have at present.

3. Their burden to the United States is lessened economically.

4. It eliminates from this group the middle man's profit in drugs.

5. It fills the waste space in private hospitals and relieves over-crowding in public hospitals.

6. The partially unemployed do not have to become charity patients.

7. The Government's obligation to its people is fulfilled in time of need, with reimbursement of the Government by those in this class who are financially responsible.

8. Those of this less than \$2,000 group, who are healthy are not taxed for the group of unhealthy, except through Government subsidy which the entire nation has to pay.

9. The fact that indigents, after restoration to health, are to be held financially responsible for debts incurred, is important. The plan will soon classify the indigent group who are in this less than \$2,000 group into the productive and non-productive by judging their future ability to pay. There will be a definite group of nonproductive individuals who are mentally or physically incapacitated due to congenital or acquired illnesses, and for this group some definite program can then be

logically outlined. As it is now, we do not have any idea how many of these incompetents we have or what we should do with them. They can pile up financial and marital obligations without restraint to the detriment of the future of our Government.

10. We have simplified the care of the sick; we have placed the burden where it economically belongs without creating a political bureaucracy.[†]

Medico-Dental Building.

THE VALUE OF DIET ANALYSIS IN PEDIATRIC PRACTICE*

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DIET, diet fads, and fancies have become almost a phobia with the public in general the past few years. Therefore, a review of the actual facts concerning diet and the method of determining a correct and adequate one does not seem amiss at this time.

In order to follow rapidly the methods used, let us briefly review the basic facts which we all know but which at times slip from our memories.

FOOD REQUIREMENTS

For adequate nutrition every individual has definite needs of energy foods: proteins, fats, carbohydrates; tissue-building foods; minerals; vitamins.

ENERGY REQUIREMENT FOR CHILDREN

Children and adolescents have a relatively higher requirement per pound of body weight than adults, due to the demand for growth.

Childhood energy requirement must provide for energy expenditure plus energy required for growth.

PROTEINS

Children and adolescents require 0.9 to 1.2 grams per pound of body weight, depending upon activity.

CARBOHYDRATES

About 50 to 60 per cent of the total calories should be in carbohydrates.

FATS

The total calories, minus the sum of protein and carbohydrate calories, give us the fat requirement.

[†] Author's Note.—This apparently is opposed to my previous policy when socialized medicine was introduced in the State Legislature several years ago. Since then there has been a rapid economic change, with political groups catering to the votes of the multitude, with medical placebos at the expense of the doctor. Therefore, some method must be evolved by the doctors which will preserve their personal relationship with the patient and give them just recompense for services rendered the group mentioned in this article.

I wish to acknowledge facts and statistics obtained from the Economic Survey of the California State Medical Association, and additional facts and data obtained from literature of the California Taxpayers' Association.

* Read before the Pediatric Section of the California Medical Association at the sixty-sixth annual session, Del Monte, May 2-6, 1937.

TABLE 1.—Average Daily Energy Requirement for Children

| Age 1 to 19 Years | | |
|-------------------|----------|-------|
| Age Years | Calories | |
| | Boys | Girls |
| 1 | 1,050 | 900 |
| 2 | 1,200 | 1,100 |
| 3 | 1,250 | 1,200 |
| 4 | 1,350 | 1,250 |
| 5 | 1,450 | 1,350 |
| 6 | 1,700 | 1,600 |
| 7 | 1,850 | 1,700 |
| 8 | 2,000 | 1,900 |
| 9 | 2,200 | 2,100 |
| 10 | 2,400 | 2,250 |
| 11 | 2,450 | 2,400 |
| 12 | 2,650 | 2,550 |
| 13 | 3,000 | 2,750 |
| 14 | 3,200 | 2,700 |
| 15 | 3,350 | 2,600 |
| 16 | 3,350 | 2,500 |
| 17 | 3,300 | 2,450 |
| 18 | 3,000 | 2,300 |
| 19 | 3,000 | 2,300 |

Adapted from report, Medico-Actuarial Mortality Investigation.

MINERAL REQUIREMENT

The ratio of calcium intake to intake of phosphorus is most important and should be between 1 to 1½, and 1 to 2.

Calcium

- Minimum, 1010 milligrams.
- Optimum, 2000 milligrams, plus.

Phosphorus

- Minimum, 1980 milligrams.
- Optimum, 3000 milligrams, plus.

IRON REQUIREMENT

According to Sherman, Rose and others, normal adults require 10 milligrams daily.

The most recent studies on children up to the age of six indicate an average iron requirement of 0.275 milligram per pound of body weight. To insure adequacy the diet should contain one and one-half times the minimum requirement, or 15 to 18 milligrams daily.

COPPER AND MANGANESE REQUIREMENT

The allowance should be 0.014 milligram per kilogram. The requirement is nearly always met even in the poorest diets. Children should have 18 milligrams daily.

IODIN REQUIREMENT

This is usually expressed in gammas, with one gamma equal to 0.001 milligram.

The authorities are not in agreement regarding the iodine requirement. One gamma of iodine is a very small part (one thousandth) of a milligram, and yet you will find that it is quite common to get one-half gamma of iodine in an average portion of most of our foods.

According to balance studies, the Swiss authority, Von Fellenberg, has calculated the human requirement at 14 gammas daily.

The British authorities, Orr and Leitch, place the adult daily requirement at 45 gammas.

Based on goiter prophylactic studies, the American authorities, Marine and Kimball, estimate the requirement at 2 milligrams for adolescents daily.

Based on rat studies, Thompson (Toronto) found that a level of 1280 gammas per 100 grams of diet was necessary to completely prevent thyroid hyperplasia. This study showed the iodine requirement to be greater on high calcium diets.

Also based on rat studies, the South Carolina group, Remington and associates, interpolated their findings to show that the average daily human requirement is 120 gammas. However, for safety, 2000 to 3000 gammas should be the daily requirement.

SODIUM, POTASSIUM, CHLORINE, SULPHUR

The authorities assume these are adequate in the American diet, but it is doubtful if this is true of potassium.

VITAMINS

A—One International unit is equivalent to 0.6 gammas of carotene.

Requirement

- Minimum, 1500 International units.
- Optimum, 7500 to 9000 International units.

B—The unit of potency of vitamin B is the Chase-Sherman unit, *i. e.*, the amount of vitamin B required to produce a gain of 3 grams per week in a B depleted rat.

Requirement

- Minimum, 100 Sherman units.
- Optimum, 200 Sherman units.

C—The International unit is equal to 0.05 milligram of ascorbic acid.

Requirement

- Minimum, 150 International units.
- Optimum, 200 International units (for infants and children).

G—The only available unit is the Sherman-Bourquin unit, which is the amount required to produce a gain of 3 grams per week in a G depleted rat.

Requirement

- Minimum, 60 Sherman-Bourquin units.
- Optimum, 100 Sherman-Bourquin units (in infants and children).

D—U. S. P. XI and the International unit represent the vitamin D potency of 0.025 gammas of calciferol. The Steenbach unit equals 3.37 International units.

| TABLE 2.—Vitamin Requirement Summary | | | | | |
|--------------------------------------|---------------------------------------|----------------------------|---------------------------------------|----------------------------|---------------------------------------|
| (Optimum Dietary Allowance) | | | | | |
| | A In- terna- tional Units | B Sher- man Units | C In- terna- tional Units | G Sher- man Units | D In- terna- tional Units |
| Infants | 7,500 | 100 | 200 | 100 | 1,070 |
| Children | 7,500 | 200 | 200 | 100 | 1,070 |
| Adoles- cents | 9,000 | 400 | 400 | 200 | 1,300 |

Requirement
Minimum, 450 International units.
Optimum, 900 International units.
The remaining vitamins have as yet no units of measurement or potency.

ACID-BASE BALANCE

The acid-base balance means the ratio between the amounts of acid-ash foods to the amount of alkaline-ash foods in the diet. (This is not to be confused with the acid-base equilibrium, p^H range, in the blood and other body fluids.) The ratio should be 1 to 3 or 4.

FUNCTIONS OF THE ACID-BASE BALANCE

1. To supply the source material for maintaining acid-base equilibrium of the body.
2. To prevent accumulation of organic acid, etc., and hence avoid acidosis.
3. To insure an adequacy of mineral.

WATER

The water requirement is four to eight glasses daily.

With these facts in mind, let us proceed to the building up of a balanced diet. (Table 3.)

That many of the diets given in textbooks on pediatrics are inadequate, is illustrated in Tables 4 and 5.

In building up a balanced diet the mother is instructed to keep a complete and accurate diet list for one week, household measurements being used. A summary is made and each food broken down into its component parts and the columns added and divided by seven. This gives a daily average, which is compared with the known requirement for the child's height, weight, and age.

The following cases have been selected to illustrate the method and value of diet analysis.

All diets were computed by use of the Di-Calator, copyrighted by M. J. Walsh of San Diego.

REPORT OF CASES

CASE 1.—P. B., female, age six years, height 44½ inches, weight 43 pounds. (Chart 7-10A and 7-10B.) This patient had been having asthmatic attacks over a period of three years. Sensitization tests had been done and all positive foods removed from her diet. Despite this the asthmatic attacks were occurring regularly every one to two weeks.

TABLE 3.—Building Up a Desirable Balanced Diet Foundation

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|--|--------------|------|-------------------------|---------------|--------------|----------------------|------|--------|-------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Minimum for Children | | | | | | | | | | | | | | | | |
| One pint whole milk | 16.0 | 19.2 | 24.0 | 328 | 576 | 448 | 1.16 | .08 | 32.0 | | 11.2 | 1,104 | 88 | 160 | 192 | 4 |
| One egg, 50 grams | 6.7 | 5.3 | | 74 | 34 | 90 | 1.3 | .12 | 1.6 | 5.5 | | 950 | 27 | 87 | 65 | |
| One potato, 100 grams | 2.2 | .1 | 18.4 | 83 | 14 | 58 | .91 | .17 | 1.6 | | 7.0 | 35 | 28 | 100 | 20 | |
| One raw green vegetable, 50 grams | .6 | .2 | 1.5 | 10 | 22 | 21 | .35 | .02 | .4 | | 3.7 | 250 | 17 | 30 | 25 | |
| One cooked vegetable, 80 grams | 1.8 | .2 | 5.9 | 34 | 37 | 42 | .74 | .08 | 1.2 | | 4.3 | 340 | 28 | 60 | | |
| One raw fruit, 100 grams | .4 | .5 | 14.2 | 125 | 7 | 12 | .5 | .01 | 1.6 | | 3.7 | 52 | 25 | 100 | 20 | |
| Two slices whole wheat bread and butter (or equivalent in cereal) | 5.2 | 21.8 | 24.8 | 324 | 30 | 96 | 1.54 | .26 | .3 | 1.8 | | 1,222 | 80 | | | |
| Total | 32.9 | 47.3 | 88.8 | 978 | 720 | 767 | 6.50 | .74 | 39.2 | 7.3 | 29.9 | 3,953 | 293 | 450 | 322 | 4 |
| Add additionally for enrichment: | | | | | | | | | | | | | | | | |
| One pint whole milk | 16.0 | 19.2 | 24.0 | 328 | 576 | 448 | 1.16 | .08 | 32.0 | | 11.2 | 1,104 | 88 | 160 | 192 | 4 |
| One extra fruit, 100 grams | 1.3 | 1.3 | 22.0 | 105 | 9 | 31 | .29 | .21 | 1.6 | | 5.6 | 350 | 38 | 170 | 35 | |
| Total | 50.2 | 67.8 | 134.8 | 1,411 | 1,305 | 1,246 | 7.95 | 1.03 | 72.8 | 7.3 | 46.7 | 5,407 | 419 | 780 | 549 | 8 |
| Four ounces beef, 112 grams | 33.9 | 6.9 | | 205 | 8 | 144 | 2.00 | .09 | .6 | 11.8 | | 18 | 19 | | 100 | |
| Total | 84.1 | 74.7 | 134.8 | 1,616 | 1,313 | 1,390 | 9.95 | 1.12 | 73.4 | 19.1 | 46.7 | 5,425 | 438 | 780 | 649 | 8 |

TABLE 4.—*Example Ideal Diet for Infant One Year, Holt & McIntosh, Tenth Edition*

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|---|--------------|------|-------------------------|---------------|--------------|----------------------|--------|---------|-------|--------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 6 a. m. | | | | | | | | | | | | | | | | |
| Milk, 8 ounces | 8.0 | 9.6 | 12.0 | 164 | 288 | 224 | .58 | .04 | 16.0 | | 5.6 | 552 | 44 | 80 | 96 | 2 |
| 10 a. m. | | | | | | | | | | | | | | | | |
| Cereal, four tablespoons, one-quarter cup | 1.35 | .6 | 5.5 | 33 | 5.5 | 32.5 | .32 | .08 | | 1.0 | | | | | | |
| Milk, 8 ounces, 240 grams | 8.0 | 9.6 | 12.0 | 164 | 288 | 224 | .58 | .04 | 16.0 | | 5.6 | 552 | 44 | 80 | 96 | 2 |
| One slice whole wheat bread and butter | 2.6 | 10.9 | 12.4 | 162 | 15 | 48 | .77 | .13 | .4 | .9 | | 611 | 40 | | | |
| 2 p. m. | | | | | | | | | | | | | | | | |
| Chopped meat, 2 tablespoons, 30 grams | 6.4 | 5.1 | | 72 | 2 | 43 | .6 | .03 | .2 | 3.5 | | 5 | 6 | | 30 | |
| Potato, 2 tablespoons, 30 grams | .7 | | 6.1 | 38 | 5 | 19 | .30 | .06 | .5 | | 2.0 | 12 | 9 | | 7 | |
| Green vegetables, 3 tablespoons, 40 grams | .8 | .1 | 1.3 | 10 | 27 | 27 | 1.54 | .05 | .6 | | 10.8 | 1,500 | 14 | | 40 | |
| Milk, 6 ounces | 6.0 | 7.1 | 9.0 | 104 | 216 | 168 | .43 | .03 | 12.0 | | 4.1 | 414 | 32 | 60 | 72 | 3 |
| 6 p. m. | | | | | | | | | | | | | | | | |
| Cereal, 4 tablespoons, ¼ cup cream of wheat | 1.1 | | 8.2 | 38 | 4 | 122 | .19 | .04 | .2 | 1.2 | | | | | | |
| Milk, 8 ounces | 8.0 | 9.6 | 12.0 | 164 | 288 | 224 | .58 | .04 | 16.0 | | 5.6 | 552 | 44 | 80 | 96 | 2 |
| One cracker | 1.0 | .9 | 7.2 | 41 | 2 | 20 | .18 | .05 | | .8 | | | | | | |
| Cooked fruit, 2 tablespoons, 30 grams | .1 | .2 | 10.0 | 41 | 3 | 5 | .12 | | | | 1.5 | | | | | |
| Total | 44.05 | 53.7 | 95.7 | 1,021 | 1,143.5 | 1,156.5 | 5.79 | .59 | 61.9 | 7.4 | 35.2 | 4,198 | 233 | 333 | 417 | 10 |
| Normal requirement | 24.0 | 47.0 | 132.0 | 1,050 | 1,000 | 1,500 | 9 mgs. | .16 mg. | 100.0 | 1 to 3 | | 7,500 | 200 | 200 | 100 | 1,000 |

Comments on above diet: Calcium-phosphorus ratio 1 to 1.2; phosphorus 24 per cent deficient in comparison with calcium present; iron 39 per cent deficient; vitamin D 99 per cent deficient; iodine at least 38 per cent deficient.

TABLE 5.—*A Day's Diet for a Child of Five Years—Royster*

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|--|--------------|------|-------------------------|---------------|--------------|----------------------|------|--------|---------|--------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Breakfast | | | | | | | | | | | | | | | | |
| One orange | 1.2 | .3 | 17.4 | 77 | 68 | 32 | .78 | .12 | 2.4 | | 8.4 | 110 | 65 | 780 | 30 | |
| Cooked oatmeal | 2.7 | 1.2 | 11.1 | 66 | 11 | 65 | .63 | .16 | .5 | 2.0 | | | | | | |
| One egg | 6.7 | 5.3 | 7.4 | 74 | 34 | 90 | 1.3 | .12 | 1.6 | 5.5 | | 950 | 27 | | 65 | |
| One slice whole wheat bread | 2.4 | .2 | 12.4 | 62 | 13 | 46 | .75 | .13 | .2 | .9 | | 11 | 40 | | | |
| Butter, one square | .2 | 10.7 | 1.0 | 100 | 2 | 2 | .02 | | .2 | | | 600 | | | | 7 |
| Milk, one six-ounce glass | 6.0 | 7.1 | 9.0 | 104 | 216 | 168 | .43 | .03 | 12.0 | | 4.1 | 414 | 32 | 60 | 72 | 3 |
| Dinner | | | | | | | | | | | | | | | | |
| Cream of pea soup | 5.6 | 6.6 | 12.2 | 128 | 100 | 140 | .68 | .02 | 2.7 | | 1.8 | | 5 | | 25 | |
| Beef, one ounce | 7.5 | 1.5 | | 45 | 2 | 36 | .5 | .02 | .2 | .3 | | 4 | 28 | 100 | 20 | |
| One baked potato | 2.2 | .1 | 18.4 | 83 | 14 | 58 | .91 | .17 | 1.6 | | 7.0 | 35 | 14 | | 16 | |
| Canned tomatoes | .9 | .4 | 3.9 | 23 | 11 | 26 | .6 | .07 | 1.6 | | 5.6 | 450 | 40 | | | |
| One slice whole wheat bread and butter | 2.6 | 10.9 | 12.4 | 162 | 15 | 48 | .77 | .13 | .4 | .9 | | 611 | | | | |
| Rice pudding | 4.5 | 3.6 | 13.0 | 98 | 65 | 130 | .2 | .2 | .5 | .3 | | | | | | |
| Supper | | | | | | | | | | | | | | | | |
| Apple sauce | .6 | .7 | 45.0 | 186 | 13 | 22 | .56 | | | | 6.7 | | | | | |
| One slice whole wheat bread and butter | 2.6 | 10.9 | 12.4 | 162 | 15 | 48 | .77 | .13 | .4 | .9 | | 611 | 40 | | | |
| Corn bread | 2.3 | .5 | 18.9 | 89 | 5 | 48 | .23 | .05 | 1.2 | 1.2 | | | | | | |
| Milk, 4 ounces | 4.0 | 4.8 | 6.0 | 82 | 144 | 112 | .29 | .02 | 8.0 | | 2.8 | 276 | 22 | 40 | 48 | 1 |
| Total | 52.0 | 64.8 | 132.1 | 1,541 | 708 | 1,071 | 9.42 | 1.24 | 33.5 | 12.0 | 36.4 | 4,072 | 313 | 980 | 276 | 11 |
| Normal requirement | 47.0 | 60.0 | 181.0 | 1,450 | 1,000 | 1,500 | 18.0 | .18 | 2,000.0 | 1 to 3 | | 7,500 | 200 | 200 | 100 | 1,070 |

Comments: Calcium and phosphorus 30 per cent deficient; iron 50 per cent deficient; iodine 98 per cent deficient; vitamin C 46 per cent deficient; vitamin D 100 per cent deficient.

TABLE 6.—Seven-day Diet of P. B. Sex, Female. Age 6

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|--|--------------|-------|-------------------------|---------------|--------------|----------------------|-------|--------|--------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Apple sauce, one cup, 200 grams | .8 | .1 | 28.4 | 250 | 14 | 24 | 1.0 | .02 | 3.2 | | 7.4 | 104 | 50 | 200 | 40 | |
| Oatmeal, two and one-half cups, 500 grams | 13.5 | .6 | 55.5 | 330 | 55 | 325 | 3.15 | .8 | 2.5 | 10.0 | | | | | | |
| Bean soup, 300 grams | 15.9 | 12.6 | 30.0 | 294 | 160 | 210 | 1.2 | .3 | 3.6 | | 15.0 | | | | | |
| Lettuce, 1,000 grams | 12.0 | 4.0 | 30.0 | 200 | 400 | 420 | 7.0 | .4 | 1.6 | | 74.0 | 5,000 | 340 | 600 | 500 | |
| Mayonnaise, 15 teaspoons, 75 grams | 1.0 | 56.0 | 2.0 | 515 | 10 | 30 | .4 | | | 1.0 | | | | | | |
| Bacon, 12 slices, 60 grams | 21.6 | 27.3 | | 345 | 6 | 129 | 1.8 | .3 | 7.2 | 7.2 | | | | | 48 | |
| Eggs, four, 200 grams | 26.8 | 21.2 | | 296 | 136 | 360 | 5.2 | .48 | 6.4 | 22.0 | | 3,800 | 108 | | 260 | |
| Sugar, 25 teaspoons, 100 grams | | | 100.0 | 400 | | | | | | | | | | | | |
| Canned cherries, one-quarter cup, 25 grams | .3 | .2 | 4.2 | 20 | 5 | 8 | .1 | .08 | .4 | | 1.1 | | | | | |
| Raw apples, six, 600 grams | 2.4 | 3.0 | 85.2 | 750 | 42 | 72 | 3.0 | .03 | 9.6 | | 22.2 | 312 | 150 | 600 | 120 | |
| Peas, one-half cup, 120 grams | 8.4 | .6 | 20.3 | 120 | 33 | 153 | 2.52 | .29 | 1.8 | | 2.0 | 540 | 130 | | 15 | |
| Baked sweet potato, 100 grams | 1.8 | .7 | 27.4 | 123 | 19 | 45 | .9 | .15 | 1.6 | | 6.7 | 300 | 28 | 100 | | |
| Baked squash, 100 grams | .6 | .1 | 3.4 | 17 | 18 | 14 | .35 | .02 | 1.6 | | 2.8 | | | | | |
| Margarine, two tablespoons, 32 grams | .4 | 25.4 | | 240 | | | | | | | | | | | | |
| Fried rabbit | 23.8 | 3.7 | | 130 | 12 | 232 | 3.2 | .35 | .5 | 10.7 | | | | | | |
| Walnuts, six, 35 grams | 6.3 | 22.4 | 4.5 | 249 | 21 | 126 | .73 | .35 | 7.0 | 2.8 | | | | | | |
| Corn starch pudding, 200 grams | 5.8 | 7.0 | 42.0 | 254 | 210 | 162 | .42 | .2 | 1.0 | | 3.2 | | | | | |
| Small glass grapefruit juice | 1.2 | .2 | 24.4 | 104 | 42 | 40 | .54 | .06 | 3.2 | | 11.2 | 140 | | 1,100 | 40 | |
| Meat loaf, 110 grams | 19.2 | 13.7 | 8.65 | 239 | 18 | 140 | 1.87 | .18 | .85 | 13.86 | | 1,295 | 54 | 50 | 125 | |
| Noodle soup, two-thirds cup, 160 grams | 1.0 | .8 | 2.0 | 22 | 1 | 12 | 1.0 | .01 | 1.8 | 1.0 | | | | | | |
| Two hard-cooked eggs, 100 grams | 13.4 | 10.6 | | 148 | 68 | 180 | 2.6 | .24 | 3.2 | 11.0 | | 1,900 | 54 | 130 | | |
| Apricots, canned, 50 grams | .5 | .2 | 6.7 | 29 | 7 | 13 | .3 | | .8 | | 1.9 | 26 | 13 | 50 | 10 | |
| Celery, 80 grams | .9 | .1 | 2.6 | 15 | 62 | 30 | .5 | .01 | 1.2 | | 6.2 | | | | | |
| Two lamb chops, 100 grams | 31.0 | 7.5 | | 196 | 11 | 200 | 1.6 | .4 | .5 | 9.6 | | 8 | 9 | | 45 | |
| Scrambled eggs, 45 grams | 4.8 | 4.2 | .7 | 58 | 39 | 72 | .89 | .08 | 1.9 | 4.0 | | 510 | 10 | | 48 | |
| Cream of pea soup, two cups, 400 grams | 11.2 | 13.2 | 34.4 | 256 | 200 | 280 | 1.36 | .04 | 5.4 | | 3.6 | | | | | |
| Canned corn, 80 grams | 2.2 | 1.0 | 15.2 | 78 | 5 | 82 | .38 | .08 | 1.2 | 1.4 | | | | | | |
| One grapefruit, 200 grams | 31.2 | .2 | 24.4 | 104 | 42 | 40 | .54 | .06 | 3.2 | | 11.2 | 140 | | 1,100 | 40 | |
| Canned pears, one cup, 200 grams | 1.2 | 1.0 | 28.2 | 126 | 30 | 56 | .70 | .2 | 3.2 | | 8.4 | | | | | |
| One slice rock cod, 100 grams | 18.7 | .5 | | 83 | 10 | 187 | .34 | .47 | 100.0 | 8.4 | | | | | | |
| Beets, 120 grams | 2.0 | .1 | 11.8 | 54 | 36 | 46 | 2.84 | .24 | 1.8 | | 13.0 | 26 | | 60 | 60 | |
| Cabbage, 40 grams | .6 | .2 | 2.2 | 13 | 18 | 12 | .14 | .02 | .6 | | 2.4 | 7 | | 140 | 20 | |
| Bean soup, 100 grams | 5.3 | 4.2 | 10.0 | 98 | 50 | 70 | .4 | .1 | 1.2 | | 5.0 | | | | | |
| Chocolate pudding, 400 grams | 14.0 | 26.4 | 105.2 | 716 | 408 | 424 | 1.64 | 1.2 | 2.0 | | 5.6 | | | | | |
| One steak, four ounces, 112 grams | 33.9 | 6.9 | | 205 | 8 | 144 | 2.0 | .09 | .6 | 11.8 | | 18 | 19 | | 100 | |
| Pig juice, 100 grams | 1.4 | .4 | 17.9 | 81 | 53 | 36 | .79 | .08 | 1.6 | | 6.5 | 45 | | | | |
| Total | 305.1 | 282.6 | 717.25 | 7,158 | 2,279 | 4,374 | 51.40 | 7.33 | 182.25 | 114.76 | 209.4 | 14,171 | 955 | 4,000 | 1,601 | 0000 |
| One-day average | 43.6 | 40.3 | 102.46 | 1,022 | 326 | 625 | 7.34 | 1.05 | 28.04 | 16.39 | 29.9 | 2,024 | 136 | 571 | 228 | |

Comments: Energy foods 36 per cent deficient; protein 10 per cent deficient; fat 40 per cent deficient; carbohydrates 49 per cent deficient; calcium 67.5 per cent deficient; phosphorus 69 per cent deficient; iron 98 per cent deficient; iodine 98 per cent deficient; alkaline foods 39 per cent deficient; vitamin A 75 per cent deficient; vitamin B 32 per cent deficient; vitamin C 25 per cent deficient; vitamin D 100 per cent deficient.

TABLE 7.—Steps in Attempting to Correct Previous Allergic Diet (P. B.)

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|--|--------------|------|-------------------------|---------------|--------------|----------------------|-------|--------|---------|----------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Daily average | 43.6 | 40.3 | 102.46 | 1,022 | 326 | 625 | 7.34 | 1.05 | 26.04 | 16.39 | 29.9 | 2,024 | 136 | 571 | 228 | |
| Normal requirement | 48.0 | 67.0 | 200.0 | 1,600 | 1,000 | 2,000 | 19.0 | .15 | 2,000.0 | 1 to 1.8 | 1 to 3 | 7,500 | 200 | 750 | 120 | 900 |
| Approximate deficiencies: Energy foods 36 per cent deficient; protein 10 per cent deficient; fat 40 per cent deficient; carbohydrates 49 per cent deficient; calcium 67.5 per cent deficient; phosphorus 60 per cent deficient; iron 19 per cent deficient; iodine 98 per cent deficient; alkaline foods 39 per cent deficient; vitamin A 75.5 per cent deficient; vitamin B 32 per cent deficient; vitamin C 25 per cent deficient; vitamin D 100 per cent deficient. | | | | | | | | | | | | | | | | |
| Add concentrates which will remedy the deficiencies of calcium, phosphorus, iron, iodine and vitamins A, B, C, G and D. | | | | | | | | | | | | | | | | |
| E. G.: Add dicalcium phosphate (60 grains, 4 drams) | | | | | | | | | | | | | | | | |
| 9 Alphabet tablets | | | | | | | | | | | | | | | | |
| 1 A and D capsule | | | | | | | | | | | | | | | | |
| Totals | | | | | 1,000 | 820 | 15.5 | .17 | 3,000.0 | | 2.0 | 1,500 | 110 | 150 | 60 | 450 |
| | | | | | 29 | 32 | | | | | | 13,300 | | | | 1,850 |
| | | | | | 1,355 | 1,477 | 22.84 | 1.22 | 3,026.0 | 16.39 | 31.9 | 16,824 | 246 | 720 | 288 | 2,300 |

Diet analysis revealed the following :

| | Per Cent Deficient |
|---------------------|-----------------------|
| Energy foods | 36 |
| Protein | 10 |
| Fat | 40 |
| Carbohydrates | 59 |
| Calcium | 67.5 |
| Phosphorus | 69 |
| Iron | 19 |
| Iodin | 98 |
| Vitamin A | 75.5 |
| Vitamin B | 32 |
| Vitamin C | 25 |
| Vitamin G | 25 |
| Vitamin D | 100 |

Corrections were made as follows : A and D capsule, one; dicalcium phosphate, 60 grains; Alphabet tablets, nine; plus increase in alkaline foods.

The composition of the Alphabet tablets is as follows :

Nine tablets contain:
1,800 U. S. P. units vitamin A
110 Sherman units vitamin B
175 International units vitamin C
900 U. S. P. XI units vitamin D
110 Sherman units vitamin G
2,500 gammas iodine
15.5 milligrams iron
.15 milligram copper
.10 milligram manganese
Also generous amounts of potassium, sodium and the trace elements.

CASE 2.—R. G., male, age 11½ years, height 59 inches, weight 73 pounds (normal 88 pounds); 15 pounds underweight.

Diet analysis :

| | Per Cent Deficient |
|----------------------|-----------------------|
| Protein | 22 |
| Fat | 15 |
| Carbohydrates | 40.5 |
| Total calories | 27.5 |
| Calcium | 25 |
| Phosphorus | 45 |
| Iron | 55 |
| Iodin | 98 |
| Alkaline food | 35 |
| Vitamin A | 45 |
| Vitamin B | 59 |
| Vitamin C | 45 |
| Vitamin G | 10 |
| Vitamin D | 95 |

It was necessary here to increase fundamental foods as follows: Milk, one quart; add one egg daily; add whole-wheat bread or whole-wheat cereal; one citrus fruit daily; two generous servings of green vegetables; one generous-sized potato; one fruit, like bananas or apples; meat with iron, iodine, and vitamins A and D.

With these changes the patient gained 4¼ pounds in two months and 12 pounds in six months.

CASE 3.—B. W., female, age eight. Referred by dentist because of caries and poor condition of teeth. Mother also complained about slowness in gaining weight.

Diet analysis :

| | Per Cent Deficient |
|---------------------|-----------------------|
| Protein | 12 |
| Fat | 25 |
| Carbohydrates | 51 |
| Total energy | 36 |
| Calcium | 30 |
| Phosphorus | 69 |
| Iron | 57 |
| Iodin | 39.5 |
| Vitamin A | 68 |
| Vitamin B | 59 |
| Vitamin C | 7 |
| Vitamin G | adequate |
| Vitamin D | 10 |

Acid-base ratio 50 per cent deficient in alkaline foods.

Corrections :

Add one pint of milk, two squares of butter, citrus fruit, one green vegetable, one potato, and six Alphabet tablets daily.

TABLE 8.—Seven-day Diet of S. S., Age 8½, Weight Fifty Pounds; Normal Weight Sixty-two Pounds; Twelve Pounds Underweight

| | Pro- tein | Fat | Car- bohy- drates | Calo- ries | Cal- cium | Phos- pho- rus | Iron | Copper | Iodin | Acid | Base | Vita- min A | Vita- min B | Vita- min C | Vita- min G | Vita- min D |
|----------------------------|--------------|-------|-------------------------|---------------|--------------|----------------------|------|--------|--------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Two oranges | 2.4 | .6 | 34.8 | 154 | 136 | 64 | 1.56 | .24 | 4.8 | | 16.8 | 220 | 130 | 1,560 | 60 | |
| Orange juice, 400 grams | 2.4 | .4 | 28.4 | 156 | 116 | 64 | .96 | .32 | 6.4 | | 18.0 | 280 | 180 | 2,080 | 80 | |
| Four tomatoes | 3.6 | 1.6 | 15.6 | 92 | 44 | 104 | 2.4 | .28 | 6.4 | | 22.4 | 2,380 | 112 | 2,080 | 64 | |
| Three-quarters waffle | 4.8 | 1.5 | 39.3 | 195 | 32 | 114 | .66 | .36 | | 3.3 | | | | | | |
| Butter, 175 grams | 2.1 | 149.1 | | 1,393 | 28 | 28 | .35 | | 28.0 | | | 8,400 | | | | |
| Milk, 3,000 grams | 99.0 | 120.0 | 150.0 | 2,070 | 3,600 | 2,790 | 7.2 | .6 | 200.0 | | 69.0 | 6,900 | 540 | 1,800 | 1,200 | |
| Eleven slices bread | 25.3 | 3.3 | 146.3 | 715 | 77 | 253 | 2.42 | .99 | 1.1 | 16.5 | | 33 | | | | |
| Peanut butter, 16 grams | 4.7 | 7.4 | 2.7 | 97 | 13 | 72 | .4 | | | .7 | | | | | | |
| Sugar, 25 grams | | | 25.0 | 100 | | | | | | | | | | | | |
| Two egg yolks | 7.8 | 16.6 | | 182 | 68 | 262 | 2.54 | .06 | 1.6 | 5.5 | | 950 | 28 | | 66 | |
| Ice cream, 200 grams | 8.0 | 28.0 | 40.0 | 444 | 300 | 240 | .42 | .04 | 8.0 | | .4 | | | | | |
| Potatoes, 200 grams | 4.4 | .2 | 36.8 | 166 | 28 | 116 | 1.82 | .34 | 3.2 | | 14.0 | 52 | 28 | | 40 | |
| Summer squash, 50 grams | .3 | | 1.7 | 8 | 9 | 7 | .17 | .01 | .8 | | 1.4 | | | | | |
| Cream, 45 grams | 1.2 | 9.0 | 2.1 | 93 | 42 | 36 | .09 | | 6.0 | | | 2,160 | | | | |
| Cheese, 90 grams | 26.1 | 32.4 | .3 | 296 | 837 | 615 | 1.23 | .15 | 12.0 | 4.8 | | 2,400 | | | | |
| Beets, 40 grams | .7 | | 3.9 | 18 | 12 | 16 | .95 | .08 | .6 | | | 7 | | | 40 | |
| Four apricots | 1.1 | .3 | 13.4 | 58 | 14 | 25 | 2.5 | .18 | 1.6 | | 6.1 | | | | | |
| Spinach, 100 grams | 2.1 | .3 | 3.2 | 24 | 67 | 68 | 3.85 | .12 | 1.6 | | 27.0 | | | | 100 | |
| Ground round, 140 grams | 33.9 | 6.9 | 1.3 | 205 | 8 | 144 | 2.0 | .09 | .6 | 11.8 | | 3,675 | 35 | | 100 | |
| Scrambled eggs, 90 grams | 9.7 | 8.1 | 30.4 | 116 | 78 | 143 | 1.79 | .16 | 3.8 | 7.0 | | 18 | 19 | | 100 | |
| Two ears corn | 4.4 | 2.0 | 30.4 | 166 | 10 | 164 | .76 | .24 | 2.4 | 2.8 | | 1,020 | 20 | | 96 | |
| Chocolate, 10 grams | 1.3 | 4.9 | .3 | 61 | 9 | 45 | .27 | .25 | | | | | | | | |
| Two plums | .7 | .2 | 12.4 | 54 | 20 | 32 | .56 | .04 | 1.6 | | | | | | | |
| Spaghetti, 100 grams | 2.7 | .1 | 16.9 | 80 | 5 | 32 | .21 | | 2.1 | | | | | | | |
| Two eggs | 13.4 | 10.6 | | 148 | 68 | 180 | 2.6 | .24 | 3.2 | 11.0 | | 1,900 | 54 | | 130 | |
| Fresh peas, 80 grams | 2.8 | .2 | 6.7 | 40 | 11 | 51 | .84 | .09 | .6 | | | 180 | 40 | | 5 | |
| Lettuce, 75 grams | .9 | .3 | 2.2 | 15 | 33 | 31 | .52 | .03 | 1.2 | | 5.5 | 375 | 25 | 45 | 37 | |
| Cream of tomato, 400 grams | 12.0 | 30.8 | 28.4 | 436 | 360 | 304 | 1.52 | .04 | 5.4 | | 10.8 | | | | | |
| Beets, 20 grams | .3 | | 1.9 | 9 | 6 | 8 | .47 | .04 | .3 | | | 3 | | | 20 | |
| Carrots, 80 grams | .9 | .3 | 7.4 | 37 | 45 | 37 | .51 | .06 | 1.2 | 8.6 | 8.6 | 1,875 | 10 | | 40 | |
| One radish | .1 | | .7 | 3 | 1 | 3 | .1 | .02 | .2 | | .3 | | | | | |
| One candy bar | 4.8 | 21.0 | 30.7 | 331 | 26 | 127 | .88 | .4 | | | 1.0 | | | | | |
| Rice krispies, 200 grams | 12.6 | .7 | 189.0 | 798 | 21 | 21 | 5.67 | .42 | 1.05 | 21.0 | | | | | | |
| One slice bacon | 1.8 | 23.0 | | 39 | | 11 | .15 | .6 | .6 | | | | | | 4 | |
| One pear | .6 | .5 | 14.1 | 63 | 15 | 26 | .35 | .1 | 1.6 | | 4.2 | | | | | |
| Eight dried cooked prunes | .3 | | 17.1 | 69 | 7 | 15 | .4 | .02 | .8 | | | | | | | |
| Asparagus, 90 grams | 1.4 | .2 | 2.6 | 18 | 20 | 31 | .8 | .07 | 1.2 | | .6 | 72 | | | | |
| Roast beef, 28 grams | 7.5 | 1.5 | | 45 | 2 | 36 | .5 | .02 | .15 | 2.9 | | 4 | 5 | | 25 | |
| One baking powder biscuit | 1.2 | 1.4 | 7.2 | 47 | 11 | 15 | .1 | | .1 | .7 | | | | | | |
| Molasses, 40 grams | .8 | | 28.0 | 114 | 36 | 18 | 2.8 | .8 | | | | | | | | |
| Raisins, 25 grams | .6 | .8 | 19.0 | 86 | 16 | 33 | .72 | .05 | .4 | | 8.4 | | | | | |
| Lemonade, 200 grams | .6 | .4 | 4.8 | 20 | 16 | 4 | .4 | .02 | .96 | | 2.8 | | | 340 | | |
| White sauce, 25 grams | .9 | 3.0 | 2.1 | 39 | 26 | 30 | .7 | .04 | .1 | | .2 | | | | | |
| String beans, 90 grams | 1.8 | .2 | 5.9 | 34 | 37 | 42 | .74 | .08 | 1.2 | | 4.3 | | | | | |
| Whipped cream, 50 grams | 1.6 | 12.0 | 2.8 | 124 | 56 | 48 | .12 | | 8.0 | | | 2,880 | | | | |
| Tuna, 50 grams | 13.3 | 5.7 | | 104 | 15 | 150 | .7 | .2 | 50.9 | 5.0 | | | | | | |
| Seven-day total | 328.9 | 484.8 | 982.1 | 9,452 | 6,332 | 6,655 | 56.7 | 7.21 | 372.76 | 95.7 | 238.4 | 36,039 | 1,264 | 7,105 | 2,107 | 000 |
| Average daily | 47.0 | 69.0 | 140.0 | 1,350 | 904 | 950 | 8.1 | 1.03 | 53.0 | 13.7 | 32.6 | 5,148 | 180 | 1,015 | 301 | |

Comments: Protein 17 per cent deficient; fat 10 per cent deficient; carbohydrates 33 per cent deficient; calories 25 per cent deficient; calcium 33 per cent deficient; phosphorus 66 per cent deficient; iron 51 per cent deficient; iodine 99 per cent deficient; alkaline food 34 per cent deficient; vitamin A 31 per cent deficient; vitamin B 60 per cent deficient; vitamin C adequate; vitamin G adequate; vitamin D 100 per cent deficient.

CASE 4.—V. P., female, age 16, height 66½ inches, weight 115 pounds (average 128). Referred by a dentist for diet analysis because of dental caries, with additional complaints made by mother of exhaustion, poor appetite, under weight, and subnormal temperature.

Diet analysis:

| | Per Cent Deficient |
|---------------------|-----------------------|
| Energy foods | 40 |
| Protein | 44 |
| Fats | 35 |
| Carbohydrates | 40 |
| Calcium | 48 |
| Phosphorus | 50 |
| Iron | 54 |
| Iodin | 99.5 |
| Vitamin A | 44 |
| Vitamin B | 50 |
| Vitamin D | 100 |

With corrected diet and rest period, this patient gained ten pounds in three months.

CASE 5.—S. S., female, age 8½ years, weight 50 pounds (normal 62); 12 pounds under weight. Complaint was inability to gain weight. Had been in preventorium for six months with weight stationary. (Table 8.)

Diet analysis:

| | Per Cent Deficient |
|---------------------|-----------------------|
| Protein | 17 |
| Fat | 10 |
| Carbohydrates | 33 |
| Calcium | 38 |
| Phosphorus | 66 |
| Iron | 51 |
| Iodin | 99 |
| Alkaline food | 34 |
| Vitamin A | 31 |
| Vitamin B | 60 |
| Vitamin C | adequate |
| Vitamin G | adequate |
| Vitamin D | 100 |

With corrected diet this patient gained two and one-half pounds in two months and four and one-quarter pounds in four months.

COMMENT

From a series of twenty-five cases, selected at random from a larger group, the following deductions may be drawn. In children's diets the amount of protein is usually deficient. The acid-base ratio is frequently out of balance. The calcium-phosphorus ratio is frequently out of balance.

In no diet has there been an adequate supply of iron, the deficiency running from 35 to 75 per cent.

In no diet has there been an adequate supply of iodine, the deficiency running from 50 to 99 per cent.

In no diet has there been an adequate supply of vitamin A, unless the patient was taking a fish-oil preparation.

All diets, unless a fish oil was taken, and barring sunshine, were 100 per cent deficient in vitamin D.

IN CONCLUSION

Diet analysis is a valuable adjunct to pediatric practice, probably its greatest usefulness being in undernutrition, allergy, and dental problem cases.

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DISCUSSION

E. EARL MOODY, M. D. (829 South Alvarado Street, Los Angeles).—We are very grateful to Doctors Hough and Walsh for reminding us of some of our shortcomings. We all know better than to allow any of our cases, that are difficult to handle, to go for any length of time on deficient diets. Yet it's so easy to allow a child to drift on a diet which is not optimum, especially if the morbid condition

for which the child consults us, is under control. We are also grateful to Doctor Hough for giving us such a good review of the essentials of a balanced diet. She has very clearly pointed out to us a method of diet analysis.

It is rather startling to see her analysis of diets, which have been published as being ideal and supposedly balanced, fall short of this balance when thoroughly analyzed. Perhaps these diets were not kept up to date in view of our modern knowledge of chemistry of foods, even though they were taken from very recent textbooks.

It has been our observation that children are very commonly deprived of sufficient minerals, vitamins, and proteins due to a poorly supervised diet. Such a deficiency, long continued, will bring an ultimate malnutrition, from which it would be most difficult to recover.

The object lesson of this paper is to challenge us to become more expert in our knowledge of dietetics, and to analyze more carefully the diet we offer children both in health and disease.

✱

HELEN B. PRYOR, M. D. (Stanford University).—We often hear of the plight of children who are undernourished because of the poverty of their parents. We do not always realize that a child may be malnourished when he lives in the midst of plenty.

I am glad that Doctor Hough has called our attention to the fact that malnutrition exists whenever a child's body is not receiving the materials necessary to its proper growth and development. And it is not the food available that determines a child's nutritional status, but only that which is eaten and utilized.

The way to be sure that a proper balance is being maintained is to analyze the weekly diets in the manner described by Doctor Hough.

I helped with the nutrition study of the children from families on relief in San Francisco, a few years ago, and analyses of their diets frequently showed deficient protein intake, probably because protein food is expensive.

In private practice, the nutrition problems and the "hunger strikers" were overwhelmingly linear-type children. In one study, we measured all the children who were brought in because of poor appetite or refusal to eat, and found that 82 per cent of them were definitely of linear type. Analysis of the diets of these children often showed a very high proportion of fat, indicating that the mothers of these slender-built children tried to change them into broad-built children by the forcing of high fat, high calory diets.

I was convinced of the folly of overstandardization in diets, as well as in other fields, when we found by experience that linear-type children responded best to low fat and low roughage diets.

A careful analysis of diets, then, is necessary to know just what a given child is getting, and this makes it possible to adjust his food to his individual needs.

✱

HELEN HOPKINS, M. D. (3875 Wilshire Boulevard, Los Angeles).—The authors have presented a method of evaluating the child's diet in relatively simple terms. Such a system could be used to advantage in those cases which show a congenital lack of interest in food and others which show decided food preferences resulting in dietary imbalance. If one is on the alert to discover food deficiencies which may develop under these circumstances, substitutions or additions may be made to the diet which would not only satisfy the child's basic physiological needs, but would make some appeal to the child. The authors have made a valuable contribution in suggesting that an exact inventory be made of the foods consumed over a given period of time. Such a study would not be necessary, however, if the child demonstrates a wholesome interest in food and if the mother follows suggestions made to her by the child's physician. I am asked almost daily, "Does my child still need to take cod-liver oil?" Such a question could be answered more convincingly if one knew the actual optimum requirements, and the child would be more apt to be supplied with the food factors needed for normal development.